

Version 2.0



Abstract

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PI Title:

Project Title: Detection of Pulmonary Aspiration Using Pulse Oximetry

Abstract: Mechanically ventilated patients are at high-risk for frequent small- volume aspirations of regurgitated gastric contents with potentially harmful consequences (e.g., pneumonia). Detection of micro-aspirations is a major clinical problem since the two most commonly used methods for this purpose (observing for dye and glucose in suctioned tracheobronchial secretions) have questionable sensitivity and specificity. The purpose of this study is to determine the extent to which a commonly used apparatus (pulse oximetry) can be used to detect micro-aspiration in an animal model. A pulse oximeter (a NONIN 8600 MV) will be applied to the animal's shaved tail and readings made at baseline and every 15 minutes for a period of 6 hours. The sample will consist of 30 anesthetized New Zealand White rabbits who are undergoing forced micro-aspiration of a solution of human gastric juice and dye-stained enteral formula. Since the presence of fiber in an enteral formula is likely to increase airway obstruction, two types of formulas will be analyzed, fiber-free and fiber-containing. There will be 12 rabbits placed in each formula group and 6 rabbits used as a control group (which will receive forced micro-aspirations of 0.9% normal saline). This sample size achieves a power of 80% at an alpha level of .01. Detection of aspiration will be considered to have occurred if there are 2 or more decreases in oxygen saturation $>3\%$ below baseline. The analysis of the proposed hypotheses will include a z-test to compare the proportion of experimental animals in which aspiration is detected by pulse oximetry. A 2 x 3 x 8 repeated measures analysis of covariance and planned comparisons will also be used to analyze relationships between the variables.

Thesaurus Terms:

clinical biomedical equipment, data collection methodology /evaluation, diagnosis design /evaluation, lung disorder, oximetry, pulse pressure wave, reflux esophagitis, respirator, tube feeding
biological model, disease /disorder proneness /risk, hospital patient care, respiratory oxygen
laboratory rabbit, reagent /indicator, statistics /biometry

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